Wild Rubber in the Brazilian Amazon, 1

Before 1913 most of the world's natural rubber was produced in Latin America, mainly in the Brazilian Amazon. Wild rubber trees were "tapped" to extract the lucrative liquid latex material. To "tap" a rubber tree, harvesters make long, spiral cuts in the bark of the tree. The milky sap drains out of the cuts and into a container.

Tapped rubber tree

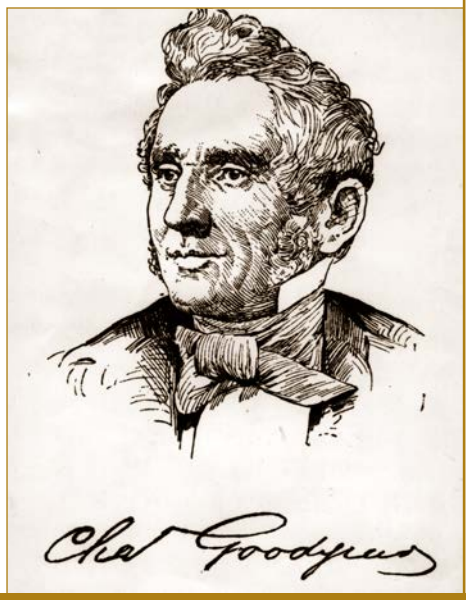
Rubber trees were not found in clusters or groves. Instead, they were scattered throughout the forest, often with only one rubber tree per square mile. This meant that gathering wild rubber was a slow, challenging process. It required tappers to wander the forest in search of trees and accumulate latex gradually from many different taps. Due to the rainy season, wild rubber was only gathered six months out of the year. This further limited the amount of rubber that could be harvested annually in the Brazilian Amazon.

Wild Rubber in the Brazilian Amazon, 2

Stands of wild rubber trees in the Amazon

Human Innovation and the Changing Uses of Rubber, 1

People have been using rubber for thousands of years. Indigenous people in the Americas used rubber balls in ceremonial games more than 3,000 years ago. The Aztec name, "Olmec," means "rubber people." Europeans began using rubber to waterproof boats and other items in the 18th century. They called rubber "gum" during this time period.



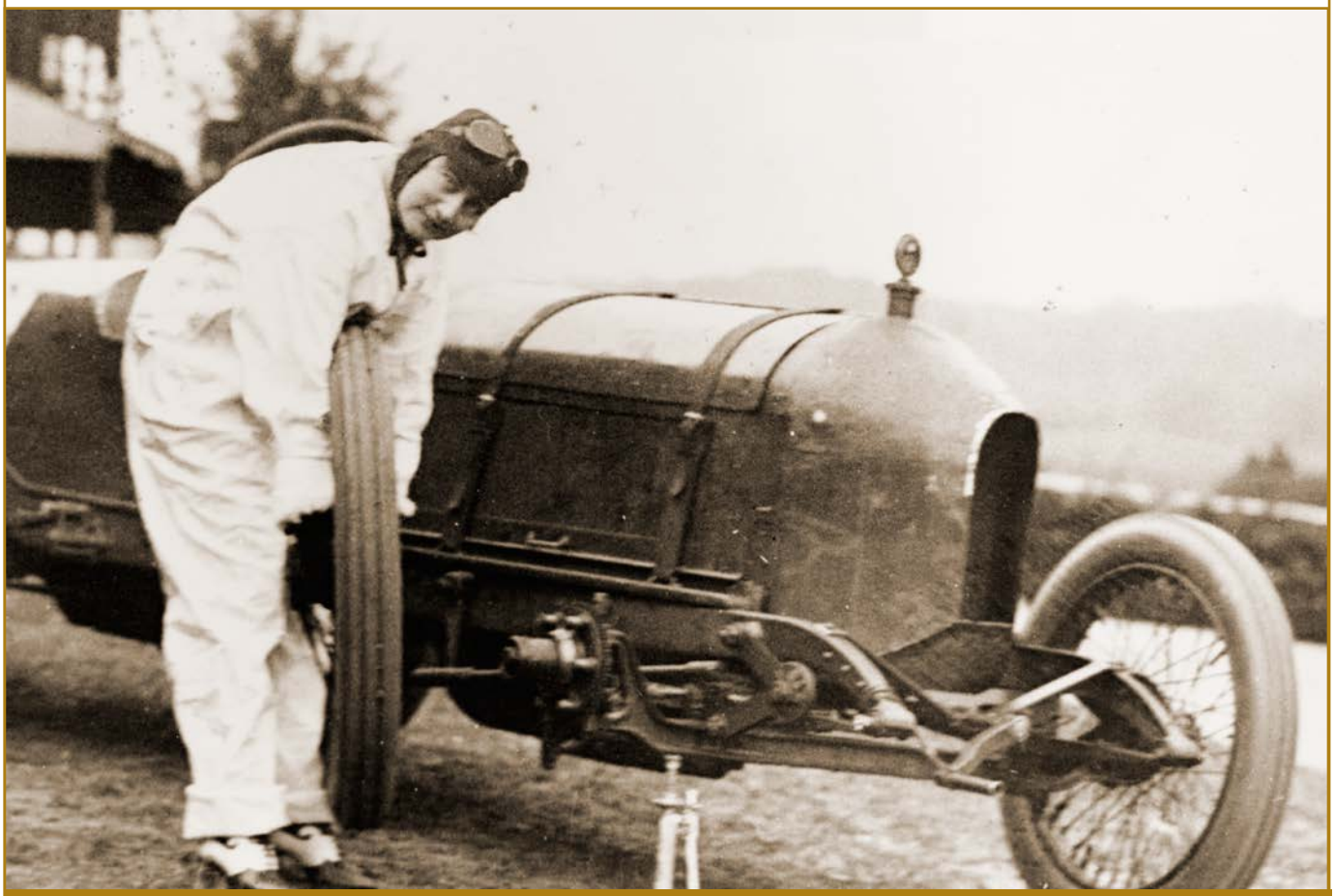
Charles Goodyear

In its natural state, rubber is very sticky. When warm, it does not hold a shape very well, and when it is cold, natural rubber becomes very brittle. Although it was useful for waterproofing, little else could be done with it until Charles Goodyear made an interesting discovery in 1839. When he mixed warmed "gum" with sulfur powder, the rubber became very elastic, held its shape, and did not crack. Others improved upon Goodyear's discovery, and the process became known as vulcanization, after the Roman god of fire, Vulcan.

Rubber ball resulting from vulcanization

Human Innovation and the Changing Uses of Rubber, 2

Charles Goodyear's discovery radically changed the way rubber could be used. Before the discovery of vulcanization, natural rubber was too sensitive to temperature changes. Vulcanization made rubber resistant to extreme temperatures, and therefore made it suitable for use in tires, tools, machine parts, and shoes. Consequently, the process of vulcanization in the 19th century caused a worldwide "rubber boom."

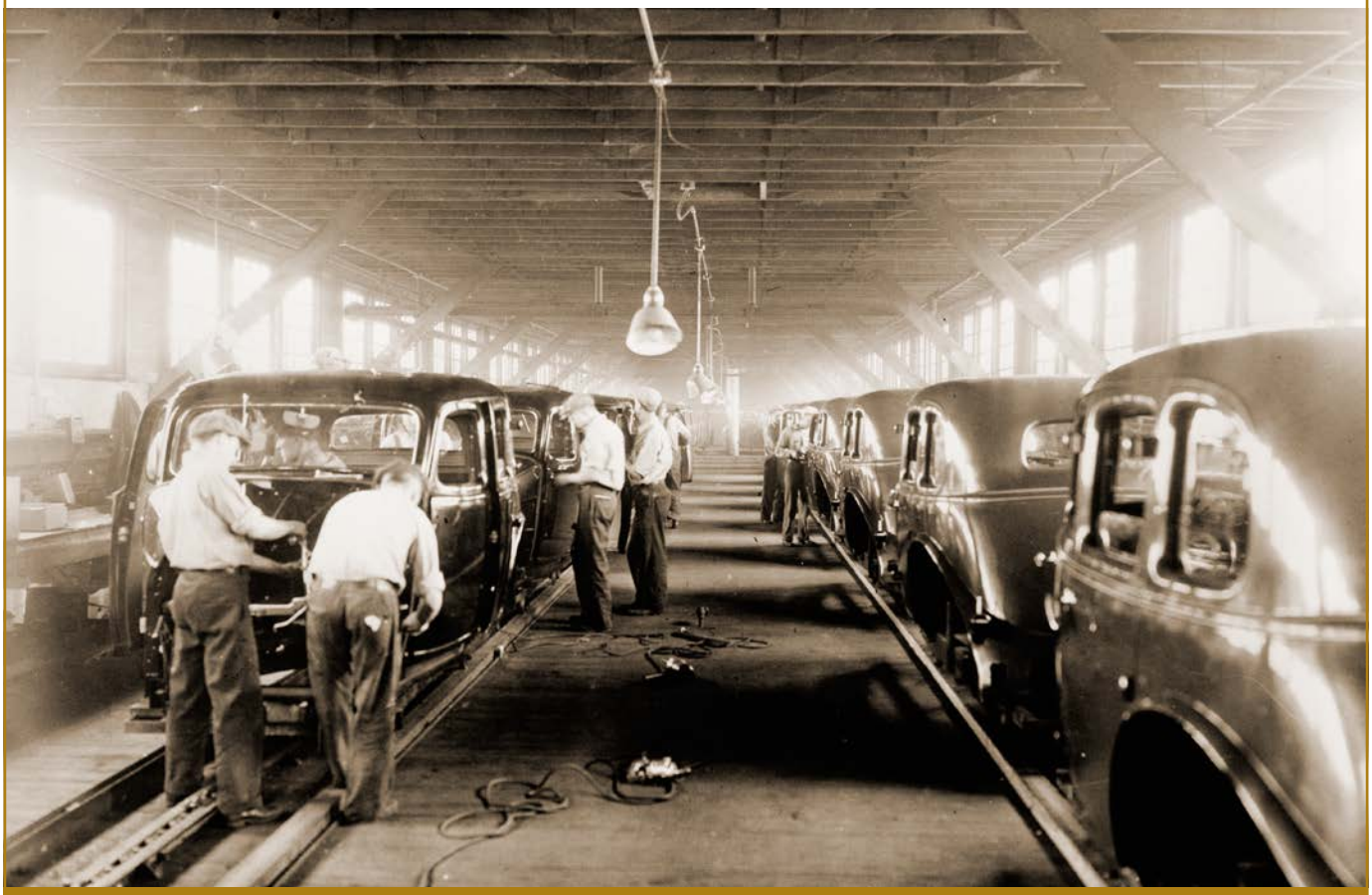


Changing a tire on a Stutz Weightman, 1916

As the consumer demand for rubber increased, rubber producers looked for ways to increase the amount of latex harvested from the Amazon. Others searched the world for places where additional rubber trees grew, or could be grown.

The Automobile Industry, 1

The first automobile manufacturers in the world were French. They manufactured bicycles and then became interested in gas-powered engines. Vulcanized rubber improved tire performance, engine parts, and made possible a new and faster way to make cars and other products—the conveyor belt.



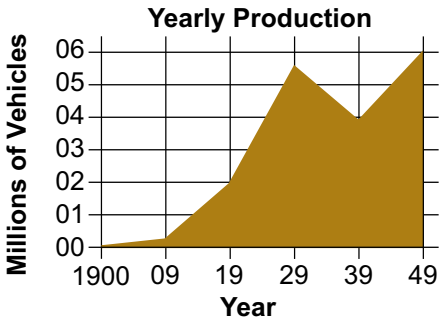
Workers on an early automobile assembly line, ca. 1934

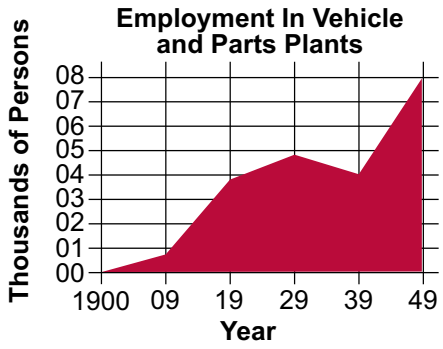
The 1901 Oldsmobile was the first American car to be made on an assembly line, but in 1913, Henry Ford added a rubber conveyor belt to speed up the process in his Ford factory. Adding a conveyor belt to the assembly line made it possible to put together a whole Model-T in 93 minutes.

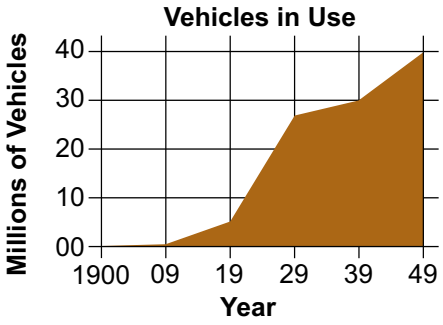
Consequently, the ability to produce more automobiles in less time brought about a car "revolution," and the use of rubber became increasingly important.

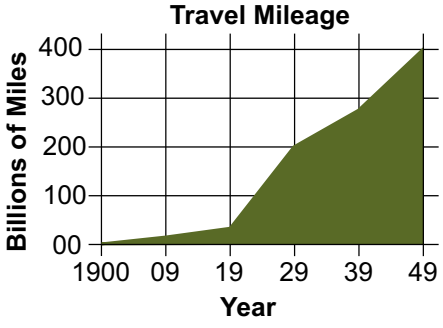
The Automobile Industry, 2

Automotive data from the early 20th century

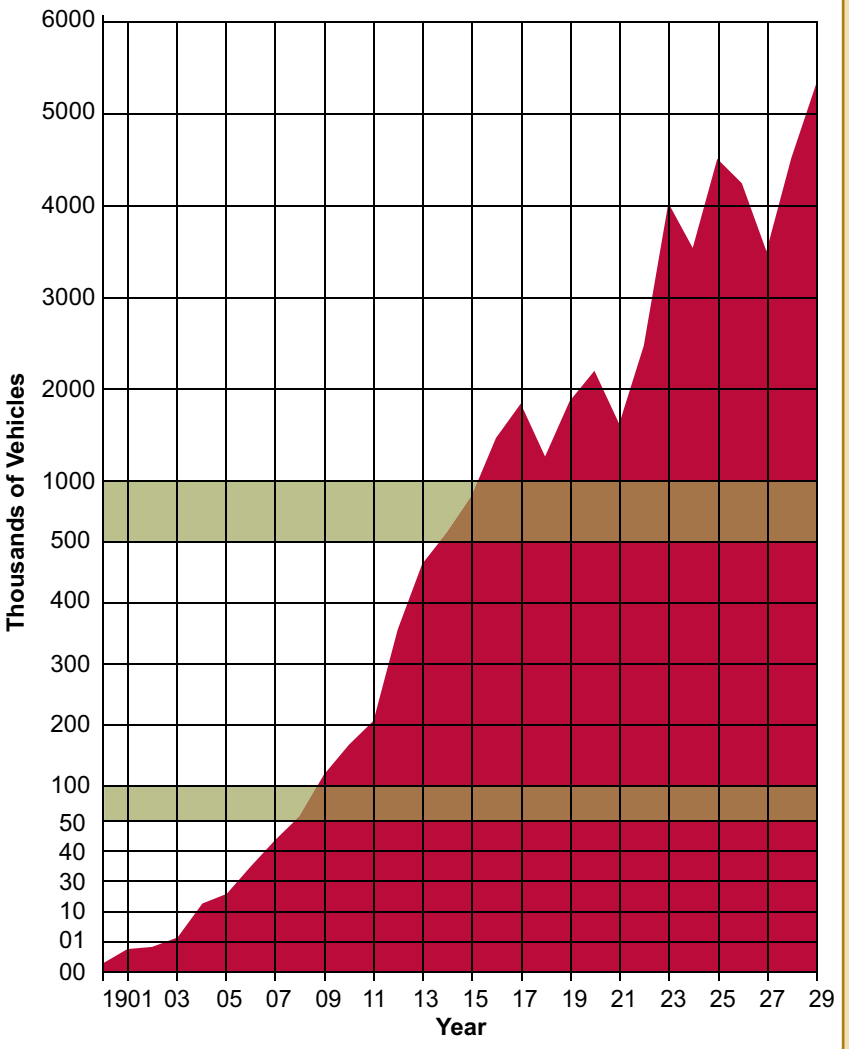








Motor vehicle factory sales, 1900 to 1929



Ford

Peak Production To Meet Record Sales

Demand for improved Ford cars during September established a sales record.

To meet this demand, Ford production is rapidly approaching a new peak, which insures early delivery.

Go to the nearest Authorized Dealer today and have him explain the many improvements that have been made.

Easy payment terms will gladly be arranged to suit your convenience.

RUNABOUT	$260	COUPE	$520
TUDOR SEDAN	580	FORDOR SEDAN	660

Closed cars in color. Demountable rims and starter extra on open cars. All prices f. o. b. Detroit.

FORD MOTOR COMPANY, DETROIT, MICHIGAN

Touring
$290
F. O. B. Detroit

Car advertisement, 1927

THE SATURDAY EVENING POST 39

Put Your Family in Keds

Canvas Rubber-soled Footwear for Men, Women and Children

KEDS is the name to guide you to grace, beauty and solid comfort in footwear. Keds is the new name of an old-established family of ultra-stylish, serviceable and comfortable rubber-soled shoes with uppers of a specially woven fine grade of canvas.

If you glory in a light, springy step, full of noiseless grace, ask your dealer for Keds. There are many styles and shapes. You can find your particular Keds, whether for the fashionable boulevard or afternoon tea on your own porch.

Keds are vogue—they are worn by particular dressers at all the smart places—they add a refreshing grace to the dainty feet of society women—they give substantial wear with good looks and solid comfort to business men—for children they are next to going "barefoot."

There are three grades of Keds. Choose the kind you want. You are sure of wear in every pair. Each grade carries with it the reputation of the largest rubber manufacturer in the world.

NATIONAL Keds $1.50 up

CAMPFIRE Keds $1.25 to $2.00

CHAMPION Keds $1.00 to $1.50

There is style in Keds. They are built on popular lasts and approved by fashion authorities.

There is comfort in Keds. The tops offer full, elastic support; the soles are durable, flexible and buoyant.

There is economy in Keds. Cost considered, Keds outwear any other footwear yet devised.

Ask your dealer to show you Keds and shoe the family in style and comfort.

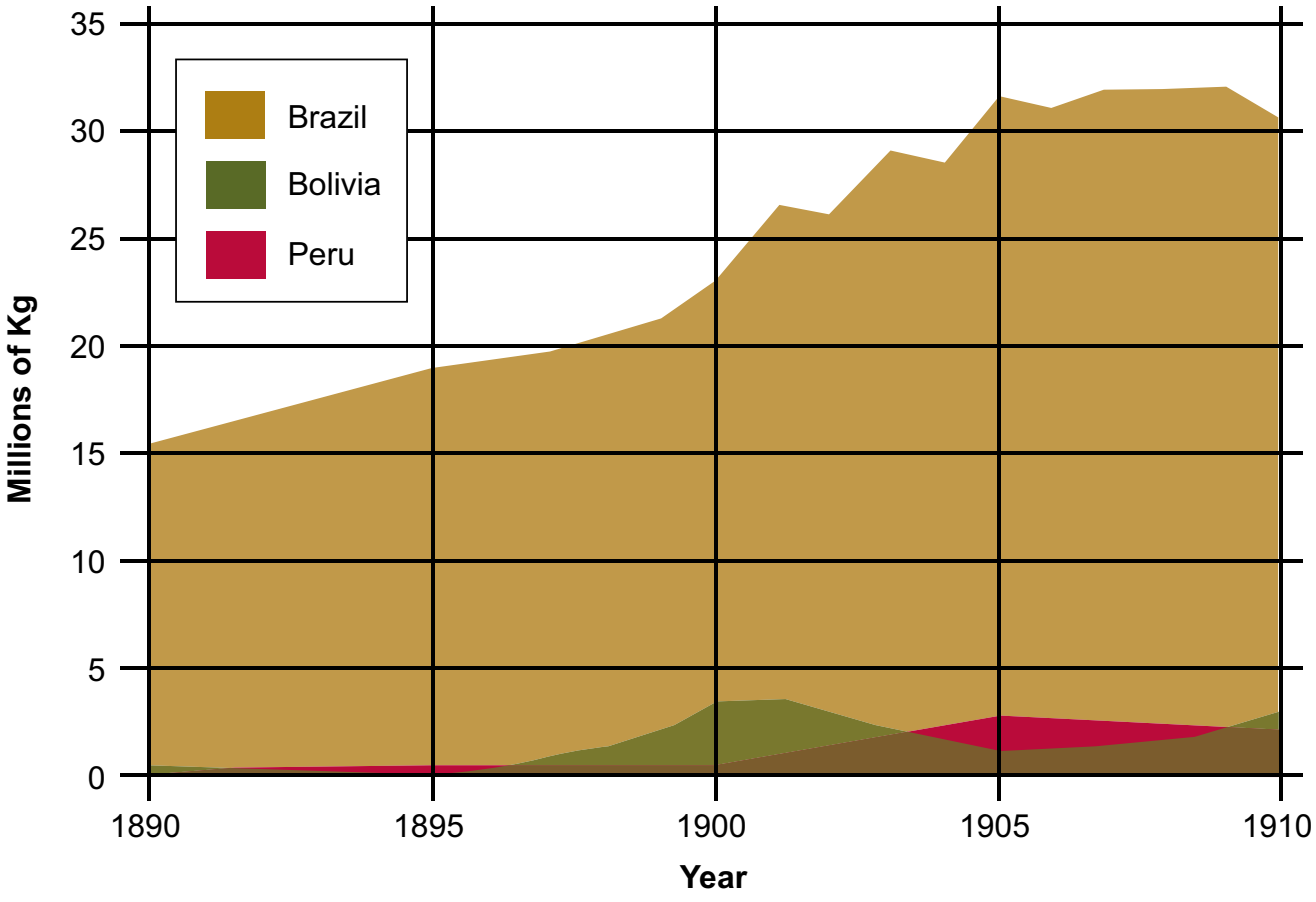
United States Rubber Company

New York

Shoe advertisement, 1917

The Decline of Amazonian Wild Rubber Production, 1

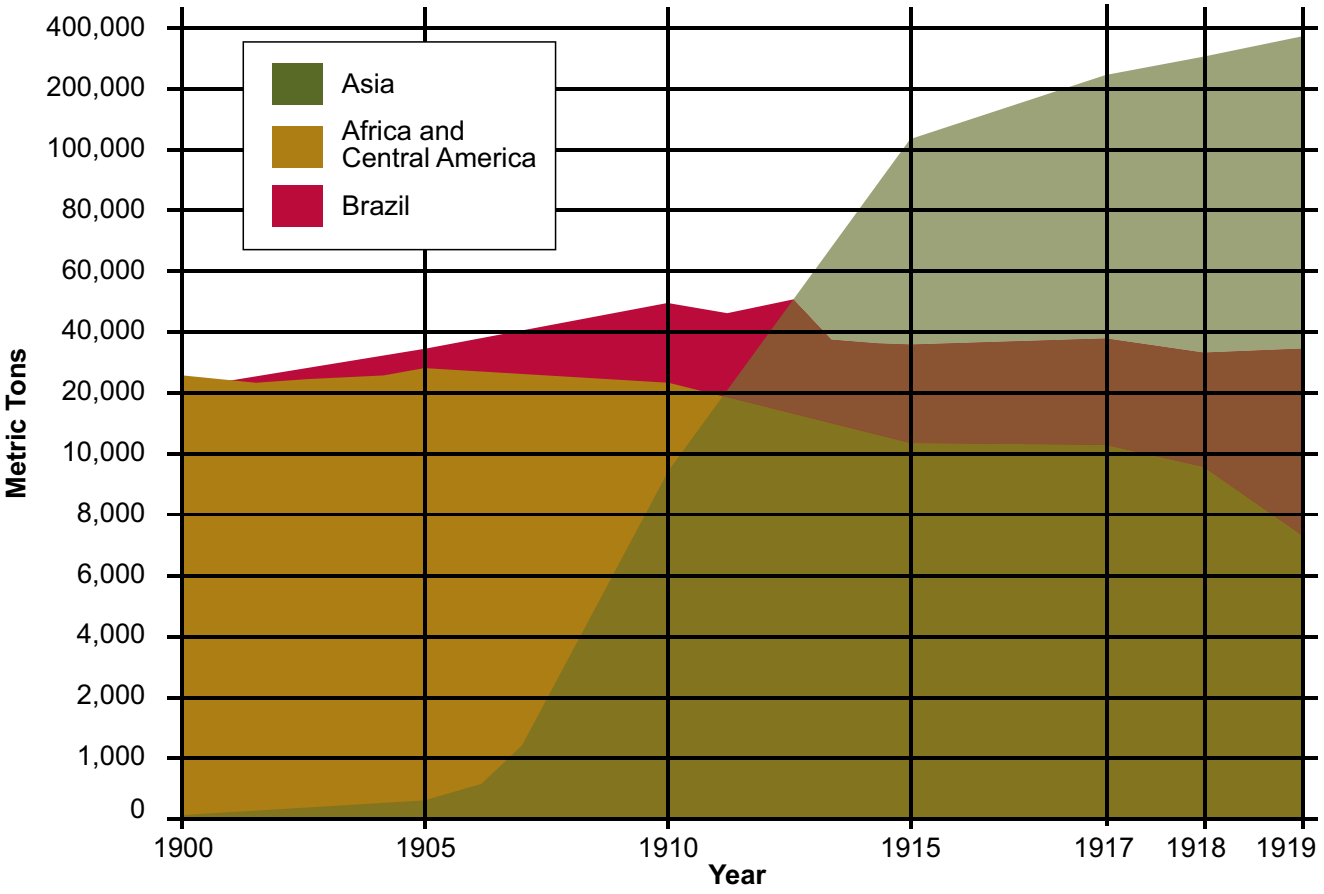
The high demand for Amazonian rubber prompted the search for alternative sources of rubber outside of South America. British scientist Henry Wickham smuggled 70,000 rubber seeds out of the Brazilian Amazon in 1876. The seeds were taken to British colonies in Southeast Asia, where the environmental conditions were similar to those in the Amazon Basin.



Wild rubber exports during the rubber boom, 1890 to 1910

The Decline of Amazonian Wild Rubber Production, 2

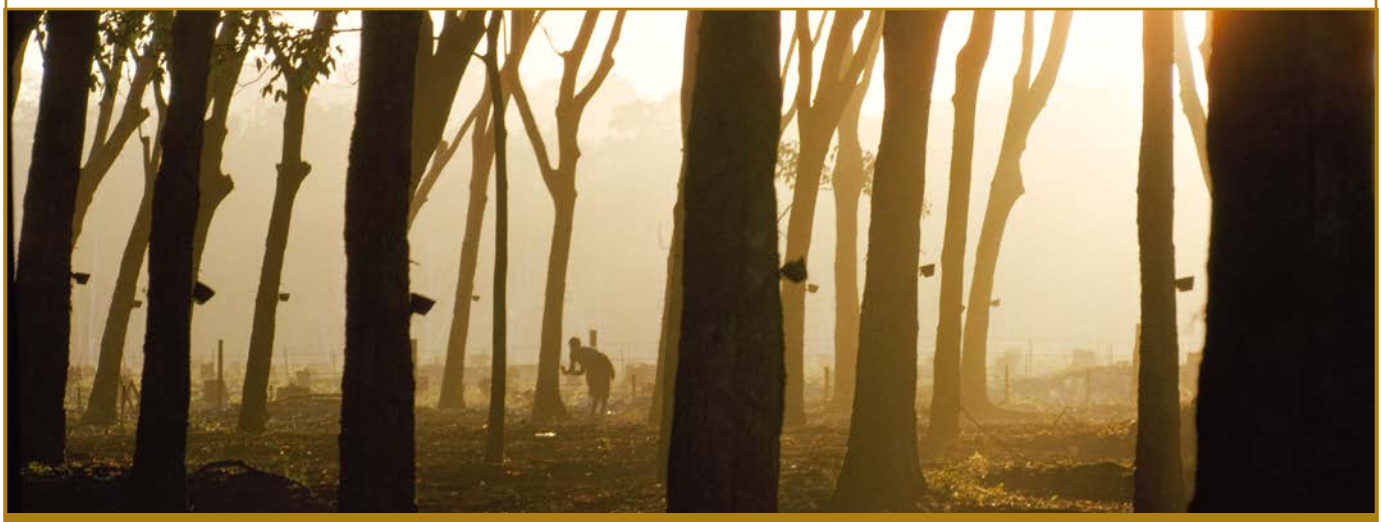
The rubber tree population exploded in the new environments. By 1895, the British colonies in Southeast Asia were quickly becoming a reliable source for large quantities of rubber.



World production of rubber, 1900 to 1919

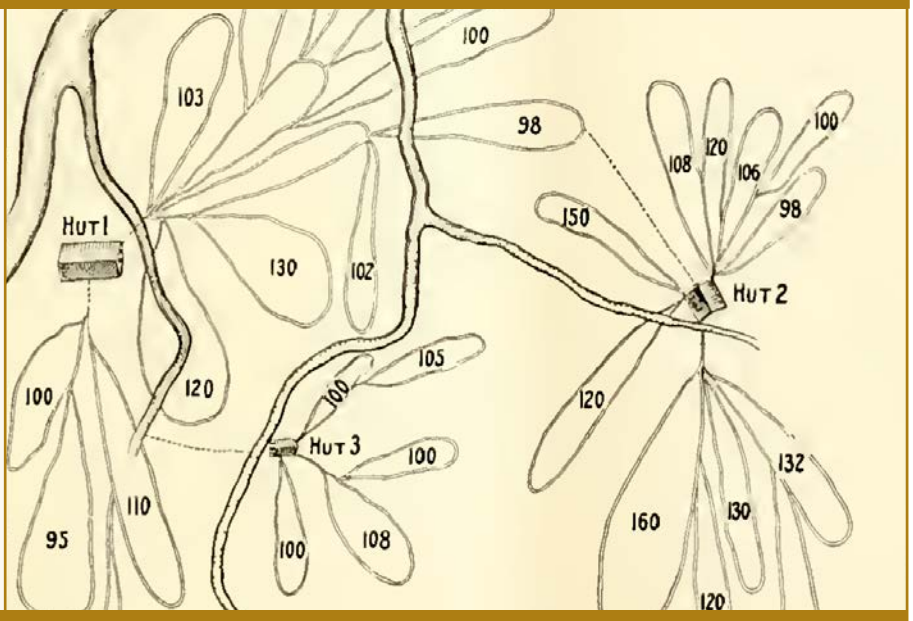
Plantation Rubber vs. Wild Rubber, 1

One way of producing more latex is to plant more rubber trees. Rubber tree plantations in Southeast Asia increased rubber production by cutting down the natural forest and planting rubber trees close together. Having the trees close together made harvesting the latex easier. These methods helped Southeast Asia quickly become a huge source of rubber to the world.



Trees on a rubber plantation in Southeast Asia

In contrast, the rubber from South America continued to come from rubber trees growing wild in the Amazon. These trees were scattered throughout the rainforest. Rubber producers created complex trail systems within the rainforest, which allowed harvesters to access the wild rubber trees.



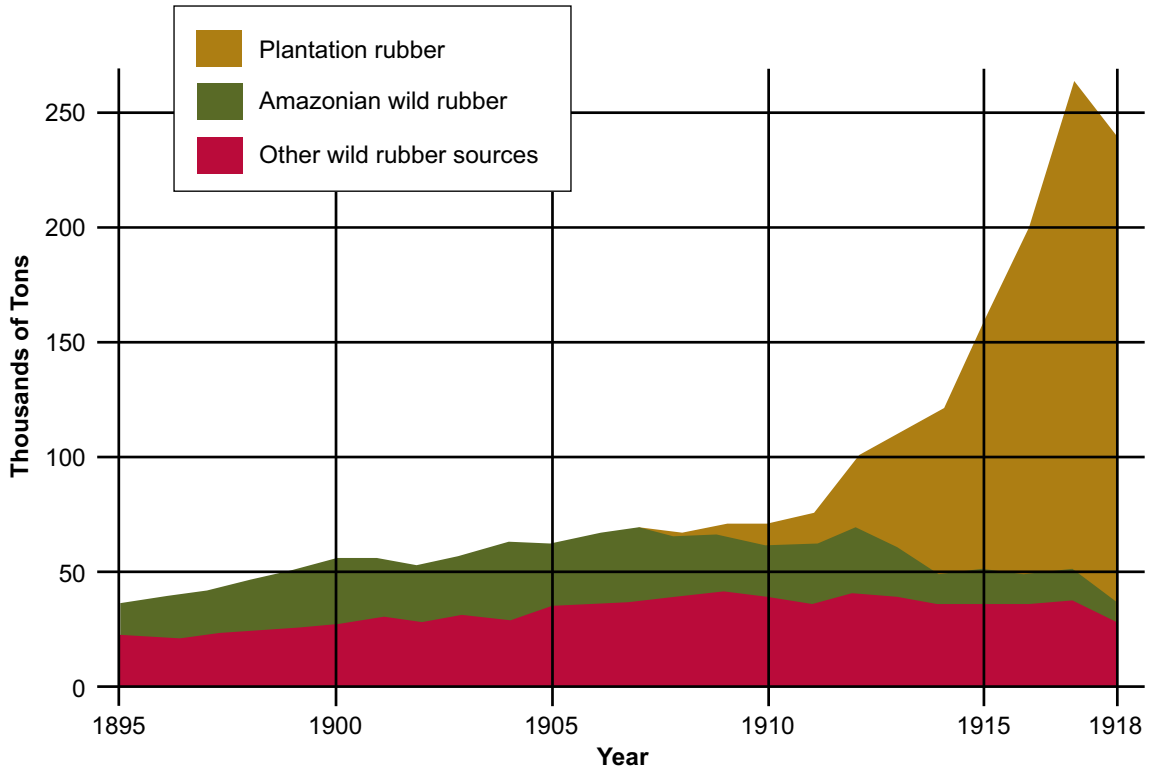
Map of rubber-harvesting trails in the Amazon

Plantation Rubber vs. Wild Rubber, 2

Brazilian rubber trees were subject to a local plant disease called South American leaf blight. Leaf blight did not normally affect many rubber trees growing in the Amazon rainforest because the pathogens (microorganisms) that cause the disease cannot "travel" from wild tree to wild tree very easily, as long as there is some distance between them. However, as the harvesters traveled between the trees, they carried the pathogens from tree to tree. On many Amazonian plantations, the disease spread and made the rubber trees less productive.

Eventually, the leaf blight, with its easy ability to spread throughout the rubber tree plantations by way of the harvesters, doomed the South American plantations to failure. Many went out of business while the Southeast Asian plantations profited.

Leaf blight on rubber tree



Plantation vs. wild rubber production worldwide, 1895 to 1918